

WE CLAIM:

- 
  1. An unitized solid oxide fuel cell, comprising:
    - a planar first interconnect that allows a first gas to flow therein;
    - a planar ceramic cell adjacent said first interconnect;
    - a planar second interconnect adjacent said ceramic cell, said second interconnect allows a second gas to flow therein;
    - 5 a plurality of gas tubes in gas communication with said ceramic cell, said gas tubes comprising:
      - a first gas inlet affixed to said first interconnect;
      - 10 a second gas inlet affixed to said second interconnect;
      - a first gas outlet in communication with said first gas inlet;
      - and
      - 15 a second gas outlet in communication with said second gas inlet.
2. The unitized fuel cell of claim 1, wherein at least one of said first and second gas outlets comprise a tube affixed to at least one of said first and second interconnects.
3. The unitized fuel cell of Claim 1, wherein at least one of said first and second gas outlets comprise a plurality of openings in at least one of said first and second interconnects.
4. The unitized fuel cell of Claim 1, wherein said first and second gas inlets have cylindrical shapes.
5. The unitized cell of Claim 1, wherein said first gas inlet is affixed adjacent an intersection of two sides of said first interconnect and said second

gas inlet is affixed adjacent an intersection of two sides of said second interconnect.

6. The unitized fuel cell of Claim 1, wherein said first gas inlet is affixed at a middle area of a side of said first interconnect and said second gas inlet is affixed at a middle area of a side of said second interconnect.

7. The unitized fuel cell of Claim 1, wherein said first gas inlet is disposed substantially parallel to said second gas inlet.

8. The unitized fuel cell of Claim 1, wherein said first gas inlet is disposed substantially perpendicular to said second gas inlet.

9. The unitized fuel cell of Claim 1, wherein said plurality of tubes have a straight shape.

10. The unitized fuel cell of Claim 1, wherein said plurality of gas tubes have a T-shape.

11. The unitized cell of Claim 10, wherein said plurality of gas tubes have a cross member portion and an inlet portion.

12. The unitized cell of Claim 11, wherein said cross member portion is disposed within at least one of said first and second interconnects, and said cross member portion is disposed immediately adjacent said inlet portion.

13. The unitized cell of Claim 12, wherein said gas tubes have a stubbed T shape.

SEARCHED  
INDEXED  
SERIALIZED  
FILED

14. The unitized cell of Claim 11, wherein the cross member portion is disposed within at least one of said first and second interconnects, and said cross member portion is disposed away from said inlet portion.

15. The unitized fuel cell of Claim 14, wherein said gas tubes have an extended T-shape.

16. An unitized solid oxide fuel cell, comprising:  
a planar first interconnect that allows a fuel to flow therein;  
a planar ceramic cell adjacent said first interconnect;  
a planar second interconnect adjacent said ceramic cell, said second interconnect allows an oxidant to flow therein;  
a plurality of gas tubes in gas communication with said ceramic cell, said gas tubes comprising:  
a fuel inlet affixed to said first interconnect;  
an oxidant inlet affixed to said second interconnect;  
a fuel outlet affixed to said first interconnect ; and  
an oxidant outlet affixed to said second interconnect.

17. The unitized fuel cell of Claim 16, wherein said first interconnect includes a first side, a second side, a third side, and a fourth side.

18. The unitized fuel cell of Claim 17, wherein said second interconnect includes a first side, a second side, a third side, and a fourth side.

19. The unitized fuel cell of Claim 18, wherein:  
said first side of first interconnect is immediately adjacent said first side of said second interconnect; and

10  
5  
10  
15  
20  
25  
30  
35  
40  
45  
50  
55  
60  
65  
70  
75  
80  
85  
90  
95

5 said second side of said first interconnect is immediately adjacent  
said second side of second interconnect.

20. The unitized fuel cell of Claim 19, wherein:

said fuel inlet is secured in said first side of said first interconnect;

5 said fuel outlet is secured in said second side of said first interconnect;

said oxidant inlet is secured in said second side of said second interconnect; and

5 said oxidant outlet is secured in said first side of said second interconnect.

21. The unitized fuel cell of Claim 20, wherein the fuel and oxidant flow in a coflow pattern.

22. The unitized fuel cell of Claim 19, wherein:

said fuel inlet is secured in said first side of said first interconnect;

5 said fuel outlet is secured in said first side of said first interconnect;

said oxidant inlet is secured in said first side of said second interconnect; and

5 said oxidant outlet is secured in said first side of said second interconnect.

23. The unitized fuel cell of Claim 22, wherein the fuel and oxidant flow in a co-flow pattern.

24. The unitized fuel cell of Claim 19, wherein:

52  
said third side of first interconnect is immediately adjacent said third side of said second interconnect; and

5 said fourth side of said first interconnect is immediately adjacent said fourth side of second interconnect.

25. The unitized fuel cell of Claim 24, wherein:

5 said fuel inlet is secured in said first side of said first interconnect;

5 said fuel outlet is secured in said second side of said first interconnect;

5 said oxidant inlet is secured in said third side of said second interconnect; and

5 said oxidant outlet is secured in said fourth side of said second interconnect.

26. The unitized fuel cell of Claim 25, wherein the fuel and oxidant flow in a cross flow pattern.

27. The unitized fuel cell of Claim 24, wherein:

5 said fuel inlet is secured in said first side of said first interconnect;

5 said fuel outlet is secured in said third side of said first interconnect;

5 said oxidant inlet is secured in said second side of said second interconnect; and

5 said oxidant outlet is secured in said third side of said second interconnect.

28. The unitized fuel cell of Claim 27, wherein the fuel and oxidant flow in a coflow pattern.